

ABSTRACT

A reflector for extreme ultraviolet light, its manufacture method, a phase shift mask, an exposure apparatus and a semiconductor manufacture method, capable of making the wavelength dependency of a reflectance via a plurality of reflection surfaces be coincident with an center wavelength of exposure light of exposure light and retaining a sufficient energy reaching a subject to be exposed. The reflector for exposure light to be used for exposure of a subject to be exposed in a lithography process of manufacturing a semiconductor device is configured to have a multi-layer film structure made by repetitively stacking a plurality of layers in the same order. The periodical length of the repetitive stack unit of the multi-layer film structure is set in such a manner that the center of full width at half maximum of the reflectance via a predetermined number of reflectors becomes coincident with the center wavelength of extreme ultraviolet light to be reflected (S102).